



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,522	07/18/2004	Chung-Chih Chen	NAUP0598USA	4521
27765	7590	08/23/2007		
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EXAMINER TADAYYON ESLAMI, TABASSOM	
			ART UNIT	PAPER NUMBER
			1762	
			NOTIFICATION DATE	DELIVERY MODE
			08/23/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

winstonhsu.uspto@gmail.com
Patent.admin.uspto.Rcv@naipo.com
mis.ap.uspto@naipo.com.tw

Office Action Summary	Application No. 10/710,522	Applicant(s) CHEN, CHUNG-CHIH	
	Examiner TabassomT Tadayyon-Eslami	Art Unit 1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/18/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/18/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7, 9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bryan C. Chung (U. S. Patent: 6361614), here after Chung.

Chung teaches,

A wafer cleaning system comprising a wet cleaning tool for performing a wafer cleaning tool for performing a wafer cleaning process [column 2, line 37] and a light

Art Unit: 1709

inhibiting means for preventing a wafer to be cleaned from light exposure during said wafer cleaning process [column 3, line 3].

Claim 9 is rejected. Chung teaches the said wet processing tool is a single – wafer-cleaning tool [claim 5].

Claim 11 is rejected. Chung teaches the said wafer is a semiconductor wafer [column 3, line 11].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 6 , 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryan C. Chung (U. S. Patent: 6361614), here after Chung further in review of A. Beverina et. al. "Copper Photocorrosion phenomenon during Post CMP Cleaning", Electrochemical and Solid-State Letters, Vol. 3(2000)156, here after Beverina.

Chung teaches,

a method of wafer cleaning [column 2, line 33], comprising:

Providing a wet cleaning tool [fig. 1 and column 3, line 30].

Transferring the wafer into said wet cleaning tool in a light inhibited manner [column 3, line 30]; and

Cleaning said main surface of said wafer by contacting a cleaning solution in said light inhibited manner [column 2, line 37].

Chung does not specifically teach the wafer comprises exposed copper feature and a dielectric film. Beverina teaches,

A wet cleaning process [abstract, line 1], comprising;

Preparing a wafer having a main surface comprising at least one exposed copper feature and a dielectric film [page 156, line 5] and eliminating the light eliminates the corrosion [abstract, line 4].

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of wet cleaning that Chung teaches on the wafer structure that Beveria teaches, because Beveria teaches eliminated the light during the cleaning step eliminates the corrosion. Therefore, it is suitable to use Chung's method to eliminate the light during the processing.

Claim 2 is rejected since Chung teaches the wafer is a semiconductor [column 3, line 11].

Claim 3 is rejected. Chung and Beveria teach the limitation of claim 1. Beveria further teaches the exposed copper feature is damascened into said dielectric film [page 156, column 1, line 6]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of wet cleaning that Chung teaches on the wafer structure that Beveria teaches, because Beveria teaches eliminated the light during the cleaning step eliminates the corrosion on copper feature into the said dielectric layer.

Art Unit: 1709

Claim 4 is rejected. Chung and Beveria teach the limitation of claim 1 and Chung further teaches the wafer is not exposed to the light during the step of cleaning process [column 3, line 13].

Claim 5 is rejected. Chung teaches the tool comprises a succession of sinks containing cleaning solution [column 1, line 41].

Claim 6 is rejected. Chung teaches the said wet processing tool is a single – wafer-cleaning tool [claim 5].

Claim 8 is rejected. Chung teaches the limitation of claim 7 and he further teaches the tool comprises a succession of sinks containing cleaning solution [column 1, line 41].

Claim 10 is rejected. Chung teaches the limitation of claim 7. Chung does not teach the exposed copper feature is damascened into said dielectric film. Beveria further teaches the exposed copper feature is damascened into said dielectric film [page 156, column 1, line 6]. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention was made to have a method of wet cleaning that Chung teaches on the wafer structure that Beveria teaches, because Beveria teaches eliminated the light during the cleaning step eliminates the corrosion on copper feature into the said dielectric layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TabassomT Tadayyon-Eslami whose telephone number is 571-270-1885. The examiner can normally be reached on 7:30-5.

Art Unit: 1709

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.T


MICHAEL B. CLEVELAND
SUPERVISORY PATENT EXAMINER